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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|------------------------------|------------------|
| 10/620,708 | 07/17/2003 | Ju-Hyun Nam | SEC.1060 | 9310 |
| 20987 | 7590 | 05/03/2006 | | |
| VOLENTINE FRANCOS, & WHITT PLLC ONE FREEDOM SQUARE 11951 FREEDOM DRIVE SUITE 1260 RESTON, VA 20190 | | | | |
| | | | EXAMINER HUSBAND, SARAH E | |
| | | | ART UNIT 1746 | PAPER NUMBER |

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|------------------------------|--|
| Office Action Summary | Application No. 10/620,708 | Applicant(s) NAM, JU-HYUN | |
| | Examiner Sarah E. Husband | Art Unit 1746 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/23/2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments, see Remarks/Arguments, filed 2/23/2006, with respect to the rejection(s) of claim(s) 1-14 under 102 and 103 have been fully considered and are persuasive. Therefore, in light of the amendments, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Aoki (US 5,635,053) and Nagamura (US 6,071,376).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 10-13 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki (US Patent No. 5,635,053) or Fujiwara (US Patent No. 5,938,857) in view of Schiele (US Patent No. 5,931,173).

Aoki and Fujiwara disclose cleaning apparatus with the various washes of hydrochloric/H₂O₂/water, ammonia/H₂O₂/water, and/or sulfuric acid/H₂O₂ (see Fig. 1, col. 1-4; Fig. 1, col. 1-4, respectively). Aoki and Fujiwara also describe wafer transport mechanisms, rinsing and drying units, and controllers (see entire document). Aoki also describes circulation and overflow systems (col. 2). Aoki and Fujiwara do not specifically describe the bubble-detecting sensor. Schiele discloses the bubble-detecting sensor. Schiele

discloses using a type of sensor that monitors vibrations and also a photosensor in a cleaning system. The Applicant also discloses in the specification that the detectors, photo, optical and vibration, are known and are readily applicable (paragraph 85). Therefore, to one of ordinary skill in the art it would be obvious to utilize any of these sensors as they would provide the same function of detecting bubbles and the substitution of known equivalent structures was found to be obvious, *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Sushi* 169 USPQ423 (CCPA 1971). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Aoki or Fujiwara with Schiele for the benefit of improved cleaning effectiveness monitoring.

Claims 6-9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki or Fujiwara and Schiele as applied to claims 1-5, 10-13 and 15-20 above, and further in view of Kitano (US Patent App. Pub. 2002/0124798).

Aoki or Fujiwara and Schiele disclose the semiconductor cleaning system shown above in the 103(a) rejection. They do not specifically disclose the transparent walls or lines. Kitano discloses that the photosensor has a part that is transparent to allow the light to pass through which would enable the sensor to operate properly (paragraph 66) and in order for a photosensor to work properly, it would be obvious to one of ordinary skill in the art to provide a transparent wall of some area in order for light to penetrate the device wherever the device may be located. As is shown by Schiele (col. 7), the device can be associated with the tank or as shown by Kitano, the device can be shown in the circulating line. At the time of the invention, it would be obvious to one of ordinary skill in the art to modify Aoki (or

Fujiwara) and Schiele with Kitano by providing a sensor in both the circulating line and the tank to provide information about the amount of bubbles found both in the fluid being sent to the tank and also on the substrate.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah E. Husband whose telephone number is (571) 272-8387. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael E. Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SEH



MICHAEL BARR
SUPERVISORY PATENT EXAMINER